



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Hyou TAKAHASHI

: Group Art Unit: 1752

Appln. No.: 10/606,845

: Examiner: LE, HOA VAN

Filed: June 27, 2003

For: RESIST COMPOSITION

DECLARATION UNDER 37 C.F.R. §1.132Assistant Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

I, Hyou Takahashi, do declare and state as follows:

I am a citizen of Japan.

I graduated from Hokkaido University, Faculty of Science, Course of Organic Chemistry in March of 1999.

Since April of 1999 I have been employed by Fuji Photo Film Co., Ltd. and have been engaged in research and development on photoresist photosensitive materials for semiconductors at the Yoshida-Minamai Factory Research Division of the company.

I am a co-inventor of the invention described and claimed in the above-named application, and I am familiar with the subject matter disclosed by the application as well as the Office Action dated March 30, 2005.

In order to demonstrate the unexpected superiority of the present invention, the following experimentation was conducted by me or under my supervision.

COMPARATIVE EXPERIMENTATION

Positive resist solutions for Examples a1, a2, b1 and b2 and Comparative Examples a' and b' as shown Table A below were prepared in the same manner as in Examples 26 to 40 of the present application. Using the obtained positive resist solutions, resist films were formed and evaluated in the same manner as in Examples 26 to 40 of the present application. The results are shown in Table B. Symbols in Table A have the same meanings of those in the specification of the present application.

Table A

	Acid Decomposable Resin 0.70g	Acid Generator (wt%)	Nitrogen-Containing Basic Compound	Solvent	Surfactant 0.001g
Example a1	R-23 Mw=8000 x/y/z=10/70/20 Mw/Mn=1.21	A-2 0.030g (4.09)	OE-1 0.002g	S-1 8.5g	W-1
Example a2	R-23 Mw=8000 x/y/z=10/70/20 Mw/Mn=1.21	A-2 0.028g (3.83)	OE-1 0.002g	S-1 8.5g	W-1
Comparative Example a'	R-23 Mw=8000 x/y/z=10/70/20 Mw/Mn=1.21	A-2 0.025g (3.44)	OE-1 0.002g	S-1 8.5g	W-1
Example b1	R-21 Mw=7000 x/y=75/25 Mw/Mn=1.13	A-1 0.100g (12.5)	OE-1 0.002g	S-1 7.0g S-2 8.5g	W-1
Example b2	R-21 Mw=7000 x/y=75/25 Mw/Mn=1.13	A-1 0.120g (14.6)	OE-1 0.002g	S-1 7.0g S-2 8.5g	W-1
Comparative Example b'	R-21 Mw=7000 x/y=75/25 Mw/Mn=1.13	A-1 0.130g (15.3)	OE-1 0.002g	S-1 7.0g S-2 8.5g	W-1

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Table B.

	Pattern Profile	Resolution of Isolated Reverse Line Pattern
Example a1	rectangular	0.055
Example a2	rectangular	0.055
Comparative Example a'	Slightly bottom-tailing	0.060
Example b1	rectangular	0.055
Example b2	rectangular	0.055
Comparative Example b'	Reverse tapering	0.070

From the comparison of Examples a1 and a2 with Comparative Example a' and the comparison of Examples b1 and b2 with Comparative Example b', it is clear that resist compositions of the present invention including the specific acid generator in the specific amount exhibit unexpected excellent effects in the pattern profile and the resolution of isolated reverse line pattern.

Therefore, the present invention is not anticipated and is not obvious from each of the cited references.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectively submitted,

Date: 2005/7/26

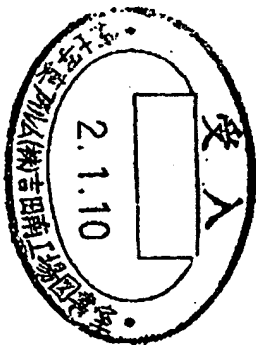
Hyou Takahashi

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編集

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東京化学同人

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基本物理定数

物理量	記号	値	単位 (SI)	精度 (ppm)
真空の光速	c	299 792 458	$\text{m}\cdot\text{s}^{-1}$	(定数)
真空の透磁率	μ_0	$4\pi\times 10^{-7}$	$\text{N}\cdot\text{A}^{-2}$	(定義)
真空の誘電率	ϵ_0	$1/\mu_0 c^2=8.854187817\cdots$	$10^{-12}\text{F}\cdot\text{m}^{-1}$	(定義)
プランク定数	h	6.6260755(40)	$10^{-34}\text{J}\cdot\text{s}$	0.60
電気素量	e	$h/2\pi=1.05457266(63)$	10^{-19}C	0.50
アボガドロ定数	N_A	6.0221367(36)	10^{23}mol^{-1}	0.30
気体定数	R	8.314510(70)	$\text{J}\cdot\text{mol}^{-1}\cdot\text{K}^{-1}$	0.59
電子の質量	m_e	9.1093897(54)	10^{-31}kg	8.4
陽子の質量	m_p	1.6726231(10)	10^{-27}kg	0.59
ニュートン定数	G	$6.67259(85)$	$\text{m}^{-3}\text{m}^3\cdot\text{kg}^{-1}\cdot\text{s}^{-2}$	0.30
リュートベリ定数	R_∞	10973731.534(13)	10^{-10}m^{-1}	0.0012
万有引力定数	G	6.67259(85)	$\text{m}^{-3}\text{m}^3\cdot\text{kg}^{-1}\cdot\text{s}^{-2}$	0.0012
ボーア半径	a_0	$h^2/m_e e^2=9.2740154(31)$	10^{-10}m	128
ボーア半径	a_0	5.29177248(24)	10^{-10}m	0.34
核磁子	μ_N	$eh/2m_p=5.0507866(17)$	$10^{-27}\text{J}\cdot\text{T}^{-1}$	0.045
核磁子	μ_N	1.01325	$10^{-27}\text{J}\cdot\text{T}^{-1}$	0.34
セルシウス温度目盛	T_0	273.15	10^3K	(定義)
理想気体の標準モル体積	V_0	$RT_0/p_0=22.41410(19)$	$10^{-3}\text{m}^3\cdot\text{mol}^{-1}$	8.4

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